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Earnings management in public healthcare organisations: the case of the English NHS hospitals

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Abstract

We explore whether NHS hospitals managed their earnings upward before applying for Foundation Trust (FT) status, a scheme that allowed them greater financial freedom and management autonomy, in order to present an overly positive picture and increase their chances for a successful application. We show that NHS FTs adjusted discretionary accruals upward for up to two years before applying for FT status. This practice was negatively associated with their future financial performance.

Impact

Our analysis shows that prospective English NHS Foundation Trusts, in anticipation of institutional reforms granting them significant freedoms, engaged in income-increasing earnings management more intensely than did NHS Trusts that never attained this status. We also provide evidence that earnings management is associated, at least partly, with the future underperformance of NHS FTs, confirming an untested hypothesis in the literature. Hence, incentives that the state provides to public organisations can have a significant effect on their behaviour—much like in the private sector. Our paper calls for improved incentive designs by regulatory bodies to prevent unintended consequences.

Keywords: earnings management, institutional transition, NHS Foundation Trusts, financial performance, healthcare, hospitals

1. Introduction

This paper tests for the existence of earnings management (hereafter, EM) among public healthcare organisations in the context of incentives arising around periods of significant institutional change. At the beginning of the new millennium, the English National Health Service (NHS) underwent a series of policy reforms that aimed to enhance patient choice, increase competition in the healthcare sector and decentralise decision-making (Department of Health 2002). Central to these reforms was the concept of 'earned autonomy', the idea that more autonomy should be given to senior managers within well-performing NHS hospitals, in order to reduce bureaucracy and improve efficiency (Davies et al., 2001). The realisation of this idea took place in 2004, when the first wave of NHS hospitals were granted Foundation Trust (hereafter, FT) status; a new organisational scheme which allowed them a greater degree of financial freedom, less centralised control and more local governance (Health and Social Care Act, 2003).

Conversion to FT status implies a number of operating and financing benefits for the hospital and its senior management team (Greener, 2004; Morrell, 2006). Unlike NHS Trusts, FTs do not have a statutory obligation to breakeven; they can retain surpluses, are free to employ new staff, invest in capital and borrow from the public or the private sector (Health and Social Care Act, 2003). More importantly, financial decisions by FTs made at the hospital level and are detached from the Department of Health's immediate control. The senior management team is accountable to the Trust's Board and a significant layer of public sector bureaucracy is removed. Hospitals are granted FT status on the basis of three main pillars: clinical excellence, financial robustness and strong leadership (Monitor, 2005; Monitor, 2013). FTs were considered the 'flagship' of NHS hospitals (BBC, 2005); hence, conversion to FT status was seen by the senior management team of hospitals, and in particular, by Chief Executive Officers

(CEOs) and Finance Directors (FDs), as the attainment of very prestigious brand name that confirmed the leadership skills of the top team of the organisation.

Despite a number of concerns regarding the new initiative, including issues of governance (Allen et al., 2012; Klein, 2004), the general perception has been that hospitals that became FTs were financially very robust (Audit Commission, 2008; Greener, 2004; Oliver, 2005). This was enhanced by the strict financial criteria that hospitals had to fulfil before applying for FT status. However, a bit more than a decade later, 118 out of 151 NHS FTs report losses (or so-called 'deficits'), and future projections do not look optimistic (Monitor, 2015). The reasons for the described financial situation of FTs are not one-dimensional, but the huge losses raise questions about the financial robustness of English hospitals prior to becoming FTs.

Previous literature has shown that English NHS hospitals had incentives to present a better financial situation even prior to the establishment of FTs, to achieve their statutory requirement to breakeven. Ballantine et al. (2007), exploring the period between 1998-2004, show that NHS Trusts made use of discretionary accruals (hereafter, *DA*) in order to meet their statutory duty to breakeven, while the distribution of their reported income showed discontinuities around zero, to avoid penalties for failure. Yet, the use of *DA* for achieving earnings targets may mechanically reverse in the future, resulting in unexpected and sudden deterioration of reported performance (Ballantine et al., 2007). This (empirically untested) expectation by Ballantine et al. (2007) implies that eventual EM practices undertaken by NHS hospitals may be negatively associated with future financial performance.

Our paper's aim is twofold. First, we explore whether NHS hospitals in England managed earnings upward prior to applying for FT status, thus presenting an overly positive picture of their financial position. In other words, we test whether the benefits of FT status provided stronger incentives for EM than the NHS Trusts' statutory obligation to breakeven did. Second,

given the expectation that EM should mechanically reverse over the course of time (Ballantine et al., 2007), we explore whether managing earnings upward prior to becoming FTs is associated, even partly, with the hospitals' future underperformance.

2. Methodology

2.1 Measuring Discretionary Accruals

To test for EM among English hospitals, we estimate and examine the properties and statistical significance of *DA*, following Ballantine et al. (2007, 2008) for the UK, and a similar methodology by Leone and Van Horn (2005) for the US. *DA* are defined as the Trust-specific residuals from the following equation, estimated yearly among NHS Trusts, based on Dechow and Dichev (2002), by incorporating the McNichols (2002) modification:

$$\Delta WC_{i,t}/TA_{i,t-1} = \alpha_0 + \alpha_1 CFO_{i,t-1}/TA_{i,t-1} + \alpha_2 CFO_{i,t}/TA_{i,t-1} + \alpha_3 CFO_{i,t+1}/TA_{i,t-1} + \alpha_4 \Delta Rev_{i,t}/TA_{i,t-1} + \alpha_5 PPE_{i,t}/TA_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

ΔWC is change in working capital accruals between years *t* and *t-1* (*Δ(Current assets - CA) – Δ(Current liabilities –CL))*, scaled by lagged Total assets (*TA*). Change in current assets is calculated by making use of all relevant assets (not just non-cash current assets). As Ballantine et al. (2007) discuss, this way of calculating change in working capital accruals includes cash balances (and also depreciation, consistent with Jones (1991), but unlike Dechow and Dichev (2002)), in an effort to reflect the scope for cash transfers within local health economies, which may be recognised as revenue. In accordance with past research (Ballantine et al., 2007 p. 425, 2008 p. 29), we add an additional NHS-specific feature by including long-term debtors in current assets, which is standard practice in NHS Trust financial statements. Finally, *CFO* represents cash flows from operations for the year, and *PPE* is a Trust's net value of Property, Plant and Equipment for the year, while all variables are scaled by lagged *TA*, as in Ballantine et al. (2007, 2008).

The first fiscal year for which FTs reported financial results was the year ending on March 31 2005.We assume that NHS Trusts submitted their applications for FT status in the year prior to the one in which this status was awarded, as indicated by Monitor (Monitor, 2015). Hence, when testing for the existence of EM for the one and two years before the application was submitted, we perform this test for the two and three years before FT status was attained. In this way, when we examine the performance of FTs three years before gaining FT status, the starting year for the sample period is 2002; when assessing the performance of FTs two years before the first Trusts became FTs, the starting year of the sample period is 2003. Finally, we use a comparison sample to FTs (NonFTs), consisting of Trusts that never became FTs during the sample period.

2.2 Sample Selection

Data were taken from the Laing and Buisson database of NHS Trust and FT financial statements, covering the period 1998-2014. To ensure sample correctness and consistency, we performed a manual check and matching process of Trusts and FTs across the years for which data were available. This process resulted in the safe identification of a total of 621 different Trusts and FTs together, out of which 147 were included in Laing and Buisson's 2014 FT data files, while 157 were included in FT files at some point in their history after 2005. Out of these 157 FTs, through a hand-tracking process, which was performed independently by the authors, 17 Trusts were removed, as they did not have data for the whole period we analysed. This resulted in a final list of 140 FTs that we could follow with certainty for the whole period. Following this initial manual sample identification process, all subsequent calculations are data-dependent.

The profitability performance measures used by this study are operating profit or operating income (surplus/deficit - before any financing - *OI*) and residual (or retained) profit or income

(surplus/deficit - *RI*). Operating income is derived after subtracting operating expenses from operating revenue, while retained income represents the equivalent of bottom-line earnings for for-profit entities, with one additional feature unique to the NHS: retained income is derived after the subtraction of the so-called Public Dividend Capital (PDC) dividend charge for the year, representing a return of 3.5% of a Trust's net assets, and reflecting the cost of capital utilised by the Trust (NHS manual for accounts, indicatively for 2013-2014 (My NHS body, 2014)). Hence, retained income in the NHS is often mentioned as 'residual income' in relevant research (Ballantine et al., 2007), indicative of this cost of capital charge, before the final profit figure is derived. The residual income figure obtained by Laing and Buisson involves its calculation after subtracting net asset impairment from the income statement, and not taking into account any prior-period adjustments or items leading to the calculation of total comprehensive income.

During our sample period, a significant change was the introduction of the International Financial Reporting Standards (IFRS). Financial statements were prepared under UK GAAP (adapted for NHS Trusts) before 2010 and, since then, have been prepared under IFRS. For 2009, Laing and Buisson provides IFRS restated data for FTs but not for NHS Trusts. Therefore, we use financial statement information for 2009 prepared under UK GAAP for both sets of Trusts. This combined use of UK GAAP and IFRS data inevitably affects the calculation of *DA*, for which we use intertemporal values for CFO around the IFRS transition year. Ellwood and Garcia-Lacalle (2012) compare UK GAAP and restated financial statements under IFRS and identify the main sources of differences between UK GAAP- and IFRS-prepared financial statements for the NHS. Given the inevitable simultaneous existence of IFRS- and UK GAAP-calculated financial results in our sample, we expect that the fact that they were applied in the same year for both Trusts and FT should alleviate any comparative biases. We further calculate

our EM measure (*DA*) on a year-by-year basis, to avoid combining values estimated under different reporting regimes over different periods.

2.3 Propensity Score Matching

As a further attempt to test for EM, we performed propensity score matching between FTs before achieving FT status and NonFTs. We employed a one-to-one nearest neighbour matching with a replacement matching procedure, restricting attention to propensity scores that support both groups of firms (Michaely and Roberts, 2012). We first estimate a probit model regression in which the dependent variable takes the value of 1 if the NHS Trust in question achieved FT status in the following two (or three) years, and zero for Trusts that never achieved foundation status (NonFTs - control sample). We include firm size (*LnTA*), and human resource cost intensity (*Staff costs/TA*$_{t-1}$) as independent variables in this probit model regression, in an effort to control for operating characteristics that are not, however, performance-related. At the same time, Monitor has reported that the cost of the workforce should be one of the main drivers of the financial deterioration of FTs (Monitor, 2015). Using the predicted probabilities (propensity scores) from the probit regression, matches are then forced between FTs and NonFTs within the same year, permitting to explicitly control for year factors. Thus, using the predicted propensity scores, each FT-year observation is matched to the corresponding NonFT-year observation, which minimises the absolute value of the difference between the propensity scores (Michaely and Roberts, 2012).

3. Empirical Findings

3.1 Descriptive Statistics

Table 1 confirms the rapid deterioration of FTs immediately after they changed status. Extremely few FTs reported deficits before attaining FT status (0.76 and 2.17% for *OI* and 7.32 and 6.92% for *RI*, for three and two years prior to FT status year, respectively). However,

relevant deficit percentages steadily exceed 10% for *OI*, and are actually around or over 25% for *RI*, one to three years after the Trust in question achieved FT status (12.32, 13.87, and 16.28 for *OI*, and 26.81, 23.82, and 24.81 for *RI*, one, two and three years post-conversion). At the same time, percentages for Trusts that never became FT during 2002-2014 are around 20% for *OI* and 37.64% for *RI* during this time. Hence, despite evidence for strong financial performance in the years before their status changed, FTs showed significantly deteriorating performance in the years immediately following their transition.

Insert Table 1 about here.

Table 2 reports percentile breakpoints for *OI* and *RI* levels (scaled by lagged Total assets) before and after achieving FT status during 2002-2014. It also reports information about mean values for *OI* and *RI* surplus/deficit levels for the same period. It shows that although mean and median values remain roughly the same, the distribution of these values for the lowest and highest percentile values is strongly differentiated for the years before, as opposed to after conversion. In the case of *OI*, only values for the lowest 1% are negative in the three and two years before conversion, while negative values are observed for up to the lowest 10% breakpoint post-conversion, and a similar behaviour is observed for *RI* level values. At the same time, values for both *OI* and *RI* appear to be more strongly negative for the lowest distribution percentiles in the post-conversion period. The opposite behaviour is seen for breakpoint values at the other end of the distribution, when comparing the pre vs. post conversion periods. Although the best performing Trusts pre-conversion did not appear to realise surpluses higher than 10%, we observe that in the post-conversion period, relevant values for *OI* and *RI* levels may easily exceed 10%, and reach up to 0.1778 for *OI* and 0.1620 for *RI* for percentile 99% three years after conversion, with a similar behaviour for the immediately lower percentile breakpoints as well. Hence, the dispersion of operating performance is greater to an impressive extent in the post vs. pre conversion period. Although a casual comparison of average performance metrics

before vs. after FT status attainment does not exhibit strong changes, there appears to exist more strongly negative and much more strongly positive performance for converted FTs in the post-conversion period, compared to a more smooth operating performance behaviour before. In other words, the number of poor, as well as very good performers increased in the years after conversion, resulting in the findings already observed from Table 1 on strongly higher percentages of FTs reporting deficits after conversion, compared to the pre-conversion period.

Insert Table 2 about here.

Table 3 reports descriptive statistics for FTs (two years before achieving FT status) in Panel A, and for Trusts that never attained FT status (NonFTs) in Panel B during 2003-2014.In Panel A, there are further reported results on statistical significance for a two-sample two-tailed *t*-test on the equality of means (by assuming that variances between the two samples are unequal), and a two-sample *Wilcoxon rank-sum (Mann-Whitney)* test for medians between FTs and Trusts that never became FTs.

Insert Table 3 about here.

FTs are observed to be, on average, significantly smaller than NonFTs, in terms of amounts of *Cash, CA, Depreciation, Intangible assets, PP&E, Total income, Income from core activities, Total expenditures,* and *Total assets. Cash flows from operations (CFO)* are significantly smaller for FTs when using medians, but not means, and there are no significant differences in *Total net assets* between the two groups. However, *OI (Operating income-surplus/deficit), and RI (Residual income -surplus/deficit)* amounts are significantly *higher* for FTs than for NonFTs in terms of amounts, despite the smaller size of the former group.

Following Table 3, FTs experience significantly higher operating and retained surpluses, whether or not scaling by lagged *TA* or Staff costs is used. Furthermore, FTs appear to be significantly less levered and more fixed, rather than intangible asset-intensive than NonFTs.

FTs have significantly lower staff costs as a percentage of their total assets than NonFTs (*Staff costs/TA$_{t-1}$*, of 0.9174 vs. 1.1059, for mean values), with higher CFO generation ability (*CFO/TA$_{t-1}$* of 0.0828 vs. 0.0715 for means). Finally, we observe that FTs tend to experience larger median increases in their income (total and core) and expenditures.

3.2 Comparative Analysis Between FTs and NonFTs

The histograms in Figure 1, present the distribution of reported *RI* scaled by lagged *TA* (Panel A) and Nondiscretionary Income (Panel B) for NHS FTs two years before achieving FT status during 2003-2014. The interval width in the histograms is 0.005, following Leone and Van Horn (2005), while frequency denotes the number of observations in a given interval. Nondiscretionary income (*NondiscrInc*) refers to residual income unaffected by *DA* (residual income minus discretionary accruals, Leone and Van Horn, 2005; using lagged *TA* scaling), computed in accordance with past research (Ballantine et al., 2007; Leone and Van Horn, 2005).

Insert Figure 1 here.

What we observe from Figure 1 for Trusts that eventually became FTs is that the distribution of their retained (or residual) income is centred on marginally positive values. A casual comparison of Panels A and B shows that the distribution for *NondiscrInc*, however, is more dispersed and not as concentrated into the zero-profit threshold. Past research has indeed shown that NHS Trusts engaged in EM in an effort to achieve the zero earnings benchmark (Ballantine et al., 2007), while histograms from Figure 1 confirm this behaviour for bottom-line income of Trusts before becoming FTs. Nevertheless, when estimating their profitability by excluding the discretionary component of accruals, profit does not exhibit the same small positive profit trends, but is rather more balanced.

Next, we directly examine whether FTs engaged in income-increasing EM, in comparison to Trusts that never achieved FT status. Table 4 Panel A shows that correlation coefficients

between *DA* and *NondiscrInc* are between -0.8 and -0.97 for FTs (two or three years before FT status conversion, respectively) and around -0.5 for the comparison sample. At the same time, performing a correlation coefficient comparison, the *Fisher r-to-z transformation - Z test*, indicates that these differences in the coefficients are strongly statistically significant at the 1% level. A strongly negative correlation between *DA* and *NondiscrInc* is consistent with reported income close to zero and nondiscretionary income equal or opposite to the value of discretionary accruals, which would be the expected behaviour of accruals if a Trust aimed to achieve a financial breakeven target (Ballantine et al., 2007). Hence, these findings indicate that this tendency is significantly stronger for FTs than for Trusts that never attained FT status.

Insert Table 4 here.

We then observe from Panel B of Table 4 that after performing one-sample tests, mean and median *DA* in the years before achieving FT status, are strongly statistically significant in every case. This result indicates a significant tendency among prospective FTs to engage in upward EM in the years before achieving FT status. More importantly, Panel C of Table 4 reports results on the significance of differences in mean (two-tailed ($Pr(|T|>|t|)$ and one-tailed ($Pr(T < t)$, testing for whether *DA* for FTs are significantly larger than *DA* for NonFTs) and median *DA* between prospective FTs and NonFTs. The comparison indicates that mean *DA* for prospective FTs for years before achieving FT status are significantly higher, compared to those observed for Trusts that never achieved FT status. The results for means are confirmed with the use of medians, for three (but not two) years before achieving FT status. Hence, results from Table 4 overall, indicate that NHS Trusts that eventually became FTs engaged in significantly stronger income-increasing EM than Trusts that did not attain FT status.

Table 5 reports results when applying PSM as described in Section 2.3, and first shows that the probability of becoming an FT significantly decreases with Trust size, and also staff cost

intensity; in other words, NHS Trusts that eventually became FTs tended to be smaller Trusts, and/or Trusts with lower staff costs as a percentage of their assets. More importantly, we observe that *DA* for Trusts that eventually became FTs are significantly higher than for Trusts that never became FTs. This result is significant for the minus-two (at the 10% level) and even more strongly for the minus-three-year period with reference to the year of the status transition. Table 5 reinforces relevant findings from Table 4, jointly indicating that prospective FTs engaged in income-increasing EM to a greater extent than did Trusts that never achieved FT status.

Insert Table 5 here

Finally, we estimate a so-called zero profit regression, introduced by Leone and Van Horn (2005). In their study, they regress *DA* on Nondiscretionary Income, controlling for lagged profitability and lagged *DA*. The prediction of this estimation favours an inverse contemporaneous relation between *DA* and *NondiscrInc*, in cases in which healthcare organisations struggle to move profitability to zero. Past research shows that NHS Trusts had a tendency to work towards achieving the zero earnings benchmark in order to achieve financial breakeven in a context unrelated to FT applications (Ballantine et al., 2007), while the prediction made by this study is that prospective FTs engaged in upwards EM more aggressively than NonFTs. In this respect, the estimation of a zero-earnings benchmark regression is expected to provide insights about which Trusts—FTs or NonFTs—were more aggressive in pursuing profitability.

Based on Leone and Van Horn (2005), we estimate the following equation using OLS and heteroscedasticity robust standard errors for NHS FTs two and three years before achieving FT status and Trusts that never achieved FT status (NonFTs - comparison sample):

$$DA_{i,t} = \alpha_0 + \alpha_1 NondiscrInc_{i,t} + \alpha_2\, RI_{i,t-1} + \alpha_3 DA_{i,t-1} + \varepsilon_{i,t} \qquad (2)$$

The dependent variable *DA* refers to estimated discretionary accruals. Independent variables include *NondiscrInc*, lagged Residual Income *(RI_{t-1}* – scaled by lagged *TA)* and lagged *DA.* If Trusts managed earnings towards the zero earnings benchmark, α_1 is expected to be negative and significant, while the predicted sign for α_2 is positive, and no prediction is made for α_3 (Leone and Van Horn, 2005). Table 6 reports the estimation results for Equation (2). There are further reported Variance Inflation Factors (*VIF*) for the variable of interest *NondiscrInc*.

Insert Table 6 here.

Table 6 shows that, when estimating Equation (2) for either the FT or NonFT sample, the signs and significance for all regressors generally conform to expectations and are consistent with Leone and Van Horn (2005). This refers to the negative and significant sign for *NondiscrInc* and the positive sign for lagged *RI*. However, the coefficient magnitude and the value of the relevant *t*-statistic for *NondiscrInc,* either two or three years before achieving FT status, are higher for the FT compared to the NonFT sample, while *VIFs* get low values for this specific variable. More importantly, judging from the values and significance of the coefficient comparison test statistic X^2, coefficients for *NondiscrInc* significantly differ between the two groups, at either the 5% (for minus two years) or the 1% (for minus three years) level. We interpret this result as indicating that prospective FTs were more eager to attain the zero earnings benchmark, compared to Trusts that did not become FTs, complementing findings from previous tables on comparatively higher upward EM for FTs vs NonFTs.

3.3 The Association between EM and Future Operating Performance

EM through the use of *DA* should eventually mechanically reverse, resulting in a sudden and unanticipated future drop in performance (Ballantine et al., 2007). Indeed, our descriptive evidence indicates a contrasting picture between the financial performance of FTs prior to acquiring their status, and immediately after they did. Therefore, we empirically test whether

EM undertaken two years before becoming FTs is associated with the probability of reporting a surplus rather than a deficit; and the level of any eventual surplus or deficit. In this way, we estimate the following equation for NHS Trusts that subsequently achieved FT status during 2003-2014:

$$\left\{Pr\left[Oper.Surplus_{i,t+3}=1\right], Pr\left[Ret.Surplus_{i,t+3}=1\right], OI_{i,t+3,}, RI_{i,t+3}\right\} = \alpha_0 + \alpha_1 DA_{i,t} + \alpha_2 OI_{i,t+2} + \alpha_3 LnTA_{i,t} + \alpha_4 \Delta(Core\ income)_{i,t} + \alpha_5 \Delta(Total\ expenditure)_{i,t} + \alpha_6 Leverage_{i,t} + \alpha_7 \Delta WC_{i,t} + \alpha_8 Staff\ Costs_{i,t} + \alpha_9 Intangible\ Assets_{i,t} + \varepsilon_{i,t} \quad (3)$$

Estimation results for Equation (3) are reported in Table 7. The dependent variable is either a binary variable equal to one if *RI* or *OI* is positive one year after the Trust achieved foundation status, and zero otherwise (Panel A); or the level of *RI* or *OI* (scaled by lagged *TA*) one year after the Trust in question achieved FT status (Panel B). When the dependent variable is in binary (continuous) form, the Equation is estimated as a probit model (using OLS). Independent variables include *DA*; operating income as of the year the FT achieved foundation status (scaled by lagged *TA* - OI_{t+2}); Trust size in terms of Total assets (*LnTA*); change in core income and total expenditures (scaled by lagged *TA* - *Δ(Core income)* and *Δ(Total expenditure)* respectively); financial leverage (expressed in the form of *Net assets/TA*); change in working capital (scaled by lagged *TA* - *ΔWC*); staff costs; and intangible asset intensity (scaled by lagged *TA* - *Staff costs* and *Intangible assets*, respectively). With the exception of OI_{t+2}, all other independent variables are taken as of two years before the Trust achieved FT status. There are further reported *VIFs* for *DA*, as the variable of interest.

We use controls for Trust size, past profitability (taken immediately before the year in which performance is assessed), and changes in income and expenditures, which could be at the root of eventual surpluses or deficits. We also control for financial leverage, staff costs and intangibles' intensity. High levels of debt could indicate strong investment opportunities or poor

operating performance, while human resource and intangibles' intensity should be expected to capture eventual value creation from investing in such resources. Finally, we use the change in working capital as a regressor, to control for an eventual mechanical effect of such changes into the measurement of accruals.

Insert Table 7 were.

Table 7, Panel A shows that *DA* are negatively and significantly associated with the probability of reporting an operating surplus one year post-FT status, and this holds for both *RI* surplus (at the 5% significance level) and *OI* surplus (at the 10% significance level). Panel B of the Table further indicates that *DA* are negatively and significantly (at the 10% level) associated with the magnitude of *RI* surplus, but are not statistically significant when expressing surplus in terms of *OI*. In other words, lower levels of EM two years before achieving FT status are associated with a higher probability of reporting a surplus one year post-FT status, and also with the magnitude of such a surplus, and vice versa. The results indicate that eventual EM undertaken by prospective FTs before achieving FT status shows reversal signs in terms of a negative effect on future operating performance. This significantly explains, at least in part, future operating performance post-FT status or eventual deficits vs. surpluses reported by FTs after receiving foundation status.

With respect to the behaviour of the rest of regressors, we observe that the probability of reporting a surplus, and the magnitude of the surplus are positively associated with previous financial performance, positive changes to revenues, decreased expenses, and increases in working capital. However, these results are not statistically significant, while we get a weak indication of a negative association between Trust size and the probability of generating an operating profit surplus.

One could counter argue here that the poor financial performance of FTs post-conversion may not be driven by EM reversal, but rather by the general conditions affecting the industry as a whole. At this point, it should be clarified that we do not make any claim in this study that prospective FTs should be overall better or worse performers compared to NonFTs. Regarding the general economic conditions in the sector, it is a fact that state funding in the English NHS has varied significantly during our period of examination. However, in results reported in Table 7, we explicitly included a control variable for the change in core Trust income, which is the main source of funding of both NonFTs and FTs, stemming from the government. In this way, although we acknowledge that the general condition of the industry could definitely play a role in the underperformance of converted FTs for some years of our sample period, this does not contradict the observation that potential EM pre-conversion has played a role as well. Findings from Table 2 also point toward this direction; they show that the percentage of FT underperformers, and relevant amounts of deficits, significantly and suddenly deteriorated in the years immediately after FT status conversion, which is consistent with a sudden reversal of EM practices by prospective FTs having marginally attained the surplus target in the years preceding conversion.

A number of robustness checks were performed to check the validity of results reported in Tables 4-7. These controls indicate that our results from Equations (2) and (3) are robust to using an alternative measure for *DA*, estimated when defining working capital accruals through the use of non-cash assets only (Ballantine et al., 2007), and also when estimating our baseline results separately for FTs with Private Finance Initiatives (PFIs), for two and three years before achieving FT status. The PFI control refers mainly to the pre-IFRS adoption years, as one of the main changes to the NHS introduced by IFRS adoption had to do with stopping the treatment of PFIs as operating leases (Ellwood and Garcia-Lacalle, 2012). Finally, results remain qualitatively similar upon not adjusting current assets for long-term debtors, consistent with

small differences in current assets values with and without including long-term debtors within them observed in Table 3. For brevity, tables reporting these results not reported, but are available from the authors upon request.

4. Conclusion

Our paper finds strong evidence that the benefits of FT status significantly led hospitals to engage in upward *DA* manipulation prior to applying for the status, in order to present an improved financial picture. Our findings are also consistent with the hypothesis that this practice was negatively associated with the future financial performance of FTs.

Evidence suggests that performance assessment may be done according to appropriate standards, yet it may miss the substantive goals behind the set targets (Bevan and Hood, 2006), with this goal to be that NHS Trusts converting to FT status showed solid evidence of financial robustness. We interpret our evidence on EM prior to applying for FT status as an indication of *"reactive gaming"* behaviour (Bevan and Hood, 2006), with reference to achieving a specific objective around an event.

Our work contributes to the scarce but increasing literature on EM in the public sector supporting the argument that financial incentives in these settings need to be carefully thought to avoid manipulation of financial accounts (Vinnari and Nasi, 2008). Pina et al. (2012) find evidence of EM in government agencies in the UK, questioning the effectiveness of financial targets associated with accrual-based measures. Similarly, Stalebrink (2007) obtain evidence of EM in Swedish municipalities, while Ferreira et al. (2013), in their study on EM in local municipalities in Portugal, identified higher EM in those municipalities where political competition was greatest. We build on this research though evidence that financial incentives in the public sector, unless carefully thought, may lead to manipulation of the accounts in ways that are not anticipated.

At this point, we acknowledge that the sole focus of our study on EM through the use of *DA* without any testing for real EM, represents an inherent limitation of our study, attributed to data unavailability in order to construct relevant cost proxies needed for real EM examination. Another limitation of our analysis is that data availability does not allow us to disentangle potential mechanisms that underline our findings. For instance, we find that the size of a Trust is a factor crucial for the success of an application for FT, but we do not offer a more detailed explanation as to why this is the case. The size of the Trust may reflect differences in the mix and range of medical services (e.g. diagnosis-related group - DRGs) or mix of patient profiles (e.g. demographic characteristics). Given the lack of such data, our analysis cannot disentangle such potential effects.

Our findings also have significant policy implications. Our evidence indicates that incentives that the state provides to public organisations can have a significant effect on their behaviour—much like in the private sector, in which firms operate in a competitive environment, building on past research examining the effects of governmental changes in regulation for the public healthcare sector (Ketelhöhn and Arévalo, 2016). Prospective NHS FTs were asked to use historical data for the past two years as inputs in determining projections for the financial model produced as part of their application for FT status (Monitor, 2005). Naturally, positive projections of future operating performance are bolstered by strong financial performance in the recent past, even outside of such a strict framework. Thus, our evidence calls for improved incentive design by regulators. Such systems could, for example, ask for a longer time series of data to be used as inputs for relevant model production. This could prevent the structuring of the Trusts' reporting behaviour around a specific incentive, or it could bring about the imposition of strict requirements for reporting financial performance on a continuous basis.

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Table 1 Operating and Residual Surplus/Deficit for NHS Foundation Trusts before/after achieving Foundation Trust (FT) status, and Trusts which never achieved this status (NonFTs)

Operating Income			Residual Income		
3y before becoming FT	N	%	3y before becoming FT	N	%
Deficit	1	0.76	Deficit	9	7.32
Surplus	131	99.24	Surplus	114	92.68
Total	132	100	Total	123	100
2y before becoming FT	N	%	2y before becoming FT	N	%
Deficit	3	2.17	Deficit	9	6.92
Surplus	135	97.83	Surplus	121	93.08
Total	138	100	Total	130	100
1y after becoming FT	N	%	1y after becoming FT	N	%
Deficit	17	12.32	Deficit	37	26.81
Surplus	121	87.68	Surplus	101	73.19
Total	138	100	Total	138	100
2y after becoming FT	N	%	2y after becoming FT	N	%
Deficit	19	13.87	Deficit	34	24.82
Surplus	118	86.13	Surplus	103	75.18
Total	137	100	Total	137	100
3y after becoming FT	N	%	3y after becoming FT	N	%
Deficit	21	16.28	Deficit	32	24.81
Surplus	108	83.72	Surplus	97	75.19
Total	129	100	Total	129	100
Trusts which never became FTs - NonFTs (2002-2014)					
	N	%		N	%
Deficit	265	20.54	Deficit	469	37.64
Surplus	1,025	79.46	Surplus	777	62.36
Total	1,290	100	Total	1,246	100

Table 2 Detailed descriptive statistics for levels of surplus/deficit for NHS Foundation Trusts (FTs) before/after FT status conversion

	Measure: OI/TA_{t-1}					Measure: RI/TA_{t-1}				
Percentile	Minus 3 years	Minus 2 years	Plus 1 year	Plus 2 years	Plus 3 years	Minus 3 years	Minus 2 years	Plus 1 year	Plus 2 years	Plus 3 years
1%	0.0001	-0.0566	-0.3036	-0.1881	-0.2079	-0.0255	-0.0849	-0.3297	-0.2137	-0.2444
5%	0.0159	0.0139	-0.0406	-0.0335	-0.0852	-0.0092	-0.0115	-0.0669	-0.0604	-0.1219
10%	0.0218	0.0225	-0.0168	-0.0102	-0.0546	0.0000	0.0000	-0.0454	-0.0363	-0.0893
25%	0.0279	0.0284	0.0226	0.0219	0.0230	0.0001	0.0001	-0.0034	0.0000	0.0010
50%	0.0333	0.0347	0.0370	0.0364	0.0385	0.0006	0.0008	0.0137	0.0103	0.0134
75%	0.0445	0.0496	0.0532	0.0539	0.0522	0.0076	0.0114	0.0296	0.0291	0.0305
90%	0.0523	0.0571	0.0722	0.0768	0.0821	0.0162	0.0259	0.0431	0.0485	0.0627
95%	0.0570	0.0887	0.0885	0.0971	0.0937	0.0197	0.0496	0.0549	0.0817	0.0712
99%	0.0790	0.1224	0.1380	0.1108	0.1778	0.0515	0.0789	0.0937	0.0933	0.1620
Mean	0.0360	0.0385	0.0310	0.0320	0.0299	0.0041	0.0063	0.0033	0.0070	0.0040

Table 3 Descriptive statistics for NHS Foundation Trusts (FTs) and Trusts which never achieved FT status (NonFTs)

Panel A: Descriptive statistics for FTs 2y before achieving FT status

	N	*Q1*	*Mean*		*Median*		*Q3*	*StDev*	*Skewness*	*Kurtosis*
Cash	140	242	1,780	***	427	***	832	4973.1700	6.2286	48.3634
Current assets (CA)	140	7,667	18,545	**	12,789	***	20,048	22309.9500	4.4875	29.1249
CA including LT debtors	140	7,723	18,655	**	12,789	***	20,100	22446.3000	4.4249	28.4185
Depreciation	140	2,613	5,497	***	4,382	*	6,801	4388.2300	2.2734	9.4563
Intangible assets	87	67	477	***	193	***	457	1068.1320	5.2750	32.4417
PP&E	140	67,625	121,026	***	102,381		152,895	81725.5800	1.7951	8.0366
Total net assets	140	65,171	120,304		100,516		153,799	82222.3100	1.7023	7.4204
Total assets	140	75,512	140,065	***	114,590		177,116	95166.1500	1.7119	6.9784
CFO	140	4,672	10,024		8,344	*	12,634	8475.9960	2.2552	9.3892
Total income	140	100,557	165,698	***	137,790	**	202,120	104003.6000	1.6814	6.1385
Income from core activities	140	89,366	144,569	***	125,205	***	184,866	85829.5400	1.4853	5.6423
Total expenditure	140	96,907	161,043	***	134,902	**	194,121	101088.5000	1.6815	6.1590
OI (Operating income-surplus/deficit)	140	2,187	4,819	***	4,152	***	6,330	4376.9020	1.4083	7.8790
RI (Residual income -surplus/deficit)	132	11	771	***	78	***	1,055	2907.4230	0.8825	14.6301
$\Delta WC/TA_{t-1}$ *(with LT debtors)*	138	-0.0625	-0.0444	***	-0.0443	***	-0.0219	0.0416	-1.0937	9.2694
$\Delta WC/TA_{t-1}$ *(without LT debtors)*	138	-0.0640	-0.0450	***	-0.0443	***	-0.0219	0.0425	-1.1618	9.3095
OI/TA_{t-1}	138	0.0284	0.0385	***	0.0347	***	0.0496	0.0244	-0.1650	10.6369
RI/TA_{t-1}	130	0.0001	0.0063	***	0.0008		0.0114	0.0227	-0.0757	13.2545
OI/Staff costs	140	0.0304	0.0457	***	0.0423	***	0.0607	0.0286	-0.3704	7.7173
RI/Staff costs	132	0.0002	0.0073	***	0.0011	***	0.0128	0.0241	-0.5362	10.9056
Net assets/TA	140	0.8353	0.8549	***	0.8714	***	0.8993	0.0678	-1.9175	7.9196
$Staff\ costs/TA_{t-1}$	138	0.7084	0.9174	***	0.8685		1.0460	0.3216	2.1021	10.2626
$Intangible\ assets/TA_{t-1}$	85	0.0010	0.0038	***	0.0022	***	0.0038	0.0062	4.5152	28.1480
$PP\&E/TA_{t-1}$	138	0.8916	0.9766	***	0.9750	***	1.0249	0.2127	3.5215	25.0182
CFO/TA_{t-1}	138	0.0564	0.0829	***	0.0767	***	0.1052	0.0398	0.8864	4.6381
$\Delta(Total\ income)/TA_{t-1}$	138	0.0625	0.1152		0.0985	***	0.1455	0.1724	8.1985	85.6968
$\Delta(Core\ income)/TA_{t-1}$	138	0.0508	0.0970		0.0842	**	0.1223	0.1525	7.8476	81.7957

Δ(Total expenditure)/TA$_{t-1}$	138	0.0532	0.1104	0.0946	**	0.1384	0.1676	8.0831	83.8983

Note: Variable definitions are reported in Section 3 and 4.1 of the text.*, **, and *** indicates statistical significance at 10%, 5% and 1%, respectively.

Panel B: Descriptive statistics for comparison sample consisting of Trusts (NonFTs) which never achieved FT status (during 2003-2014)

	N	*Q1*	*Mean*	*Median*	*Q3*	*StDev*	*Skewness*	*Kurtosis*
Cash	1,348	288	4,952	946	5,784	9519.3410	4.0006	23.9440
Current assets (CA)	1,352	8,493	22,755	16,674	27,881	23849.2000	3.4798	21.8348
CA including LT debtors	1,352	8,586	23,461	17,120	28,660	24484.0300	3.3314	20.2662
Depreciation	1,347	2,377	7,088	5,098	9,469	6712.5100	2.0605	8.8620
Intangible assets	944	114	1,021	409	1,186	1881.9110	5.4634	45.8817
PP&E	1,347	54,605	144,851	111,607	202,883	129367.9000	2.0565	10.8164
Total net assets	1,352	48,335	122,250	94,587	172,903	103961.2000	1.6459	7.2511
Total assets	1,352	66,654	168,622	128,240	233,955	147716.5000	2.1417	11.4486
CFO	1,356	2,406	9,464	6,891	14,152	13823.4800	0.9476	10.4139
Total income	1,356	93,730	209,234	166,167	271,251	168611.1000	2.0268	9.0513
Income from core activities	1,356	82,796	184,624	152,235	238,227	140437.3000	1.7534	7.5182
Total expenditure	1,356	92,559	207,639	164,220	267,949	169528.6000	2.0919	9.5478
OI (Operating income-surplus/deficit)	1,356	486	1,693	2,482	6,411	14461.5500	-7.0306	93.0843
RI (Residual income -surplus/deficit)	1,308	-2,515	-3,776	29	1,015	17468.0800	-8.2678	109.1345
ΔWC/TA$_{t-1}$ (with LT debtors)	1,283	-0.0855	-0.0601	-0.0520	-0.0257	0.1119	-2.4053	41.1344
ΔWC/TA$_{t-1}$ (without LT debtors)	1,283	-0.0856	-0.0612	-0.0517	-0.0257	0.1133	-2.3705	39.3528
OI/TA$_{t-1}$	1,290	0.0102	0.0164	0.0305	0.0440	0.0810	-7.3089	87.2995
RI/TA$_{t-1}$	1,246	-0.0210	-0.0173	0.0003	0.0085	0.0933	-6.3391	62.4565
OI/Staff costs	1,356	0.0095	0.0191	0.0318	0.0503	0.0730	-4.0176	32.3446
RI/Staff costs	1,308	-0.0248	-0.0238	0.0004	0.0101	0.1305	-15.2672	333.5026
Net assets/TA	1,352	0.7044	0.7431	0.8133	0.8716	0.2035	-2.1736	9.2288
Staff costs/TA$_{t-1}$	1,290	0.7213	1.1059	0.8622	1.1154	1.0566	5.8364	47.2779
Intangible assets/TA$_{t-1}$	902	0.0012	0.0083	0.0035	0.0083	0.0242	12.9968	208.7218
PP&E/TA$_{t-1}$	1,284	0.8172	0.9165	0.9100	0.9953	0.3475	7.9215	129.5414
CFO/TA$_{t-1}$	1,290	0.0390	0.0715	0.0675	0.1000	0.0944	-0.0475	41.7645

Δ(Total income)/TA$_{t-1}$	1,290	0.0292	0.0990	0.0733	0.1296	0.3011	9.3868	196.2422
Δ(Core income)/TA$_{t-1}$	1,290	0.0257	0.0903	0.0678	0.1190	0.2908	9.5266	201.3858
Δ(Total expenditure)/TA$_{t-1}$	1,290	0.0269	0.1027	0.0796	0.1380	0.3125	8.0498	169.8572

Table 4 Earnings management by NHS Foundation Trusts (FTs) before achieving FT status vs. Trusts which never achieved FT status (NonFTs)

Panel A: Pearson correlation coefficient between discretionary accruals (*DA*) - Nondiscretionary income (*NondiscrInc*)

	NHS FTs		Comparison sample- NonFTs		Comparison of correlation coefficients between FTs/NonFTs			
	Correlation coef.	*N*	*Correlation coef.*	*N*	*Fisher r-to-z transformation - Z-stat*			
2y before becoming FT	-0.8251	130	-0.5247	1,052	-6.28	***		
3y before becoming FT	-0.9679	123	-0.5484	1,162	-15.04	***		

Panel B: Test for the statistical significance of mean/median *DA* for NHS FTs before achieving FT status

Mean *DA*	*N*	*Mean*	*StError*	*t-stat.*	*Pr(|T|>|t|)*		*Pr(T>t)*	
2y before becoming FT	138	0.0067	0.0033	1.9908	0.0485	**	0.0242	**
3y before becoming FT	132	0.0098	0.0039	2.4884	0.0141	**	0.0070	***
Median *DA*	*N*	*Median*	*Z-stat.*	*Prob>|z|*				
2y before becoming FT	138	0.0053	1.9780	0.0480	***			
3y before becoming FT	132	0.0095	2.6010	0.0093	**			

Panel C: Tests for differences in means/medians for *DA* between FTs-NonFTs

Means		*N*	*Mean*	*StError*	*t-stat.*	*Pr(|T|>|t|)*		*Pr(T < t)*	
2y before becoming FT	NonFTs	1,088	-0.0016	0.0023					
	FTs	138	0.0067	0.0033					
	Difference		-0.0083	0.0041	-2.0388	0.0424	**	0.0212	**
3y before becoming FT	NonFTs	1,216	-0.0008	0.0021					
	FTs	132	0.0098	0.0039					
	Difference		-0.0106	0.0045	-2.3793	0.0182	**	0.0091	***
Medians		*N*	*Z-stat.*	*Prob>|z|*					
2y before becoming FT	NonFTs	1,088							
	FTs	138	-1.3720	0.1700					
3y before becoming FT	NonFTs	1,216							
	FTs	132	-1.6670	0.0955	*				

Note: *DA* are estimated as described in Section 3.1. *, **, and *** indicates statistical significance at 10%, 5% and 1%, respectively.

Table 5 Testing for EM by performing propensity score matching between FTs before achieving FT status vs. NonFTs

2y before becoming FT				
Probit model estimation	*Coef.*	*StError*	*Z-stat*	
c	0.1383	0.6893	0.20	
LnTA	-0.0999	0.0549	-1.82	*
Staff costs/TA$_{t-1}$	-0.2756	0.1107	-2.49	**
N	1,424			
X^2	10.54	***		
Log likelihood	-447.903			
Pseudo R^2	0.0116			
Mean *DA* comparison				
	Treated	*Control*	*% bias*	*t-test*
DA	0.0067	-0.0036	16.90	1.84 *

3y before becoming FT				
Probit model estimation	*Coef*	*St Er*	*Z-stat.*	
c	0.0489	0.6505	0.08	
LnTA	-0.1024	0.0521	-1.97	**
Staff costs/TA$_{t-1}$	-0.2620	0.1110	-2.36	*
N	1,607			
X^2	9.72	***		
Log likelihood	-451.475			
Pseudo R^2	0.0106			
Mean *DA* comparison				
	Treated	*Control*	*% bias*	*t-test*
DA	0.0098	-0.0084	29.8	3.04 ***

Note: The propensity score matching procedure and variable definitions are described in Section 4.2. **, and *** indicates statistical significance at 10%, 5% and 1%, respectively.

Table 6 Regression estimations on the zero profit hypothesis - comparison between NHS Foundation Trusts (FTs) before achieving FT status and Trusts which never achieved FT status (NonFTs)

FTs				NonFTs - Comparison sample			
2y before becoming FT	*Coef.*	*t-stat.*			*Coef.*	*t-stat.*	.
c	0.0041	1.98	**	*c*	-0.0099	-5.42	***
NondiscrInc	-0.8567	-7.68	***	*NondiscrInc*	-0.5130	-3.77	***
Lagged RI/TA$_{t-1}$	0.5657	2.18	**	*Lagged RI/TA$_{t-1}$*	0.0625	1.15	
Lagged DA	0.0038	0.07		*Lagged DA*	-0.0151	-0.34	
F-stat.	24.19	***		*F-stat.*	5.77	***	
R-Squared	0.7039			*R-Squared*	0.298		
N	121			*N*	960		
VIF NondiscrInc	1.04			*VIF NondiscrInc*	1.02		
3y before becoming FT	*Coef.*	*t-stat.*			*Coef.*	*t-stat.*	
c	0.0040	3.59	***	*c*	-0.0089	-5.37	***
NondiscrInc	-0.9968	-23.50	***	*NondiscrInc*	-0.5412	-4.18	***
Lagged RI/TA$_{t-1}$	0.1165	1.52		*Lagged RI/TA$_{t-1}$*	0.0728	1.43	

Lagged DA -	-0.0246	-0.85		*Lagged DA*	-0.0197	-0.52
F-stat.	207.84	***		*F-stat.*	6.68	***
R-Squared	0.9400			*R-Squared*	0.2570	
N	110			*N*	1,057	
VIF NondiscrInc	1.03			*VIF NondiscrInc*	1.02	
Coefficient comparison tests for *NondiscrInc* between FTs and NonFTs regressions						
2y before becoming FT						
X^2*stat*	3.88	**				
3y before becoming FT						
X^2*stat*	11.24	***				

Note: Variable definitions are described in Sections 3.1 and 4.2. *, **, and *** indicates statistical significance at 10%, 5% and 1%, respectively.

Table 7 The impact of potential earnings management by NHS Foundation Trusts (FTs) before achieving FT status on their subsequent operating performance

Panel A: Dependent variable = binary variable equal to one if *RI* or *OI* is positive one year post-FT status, and zero otherwise

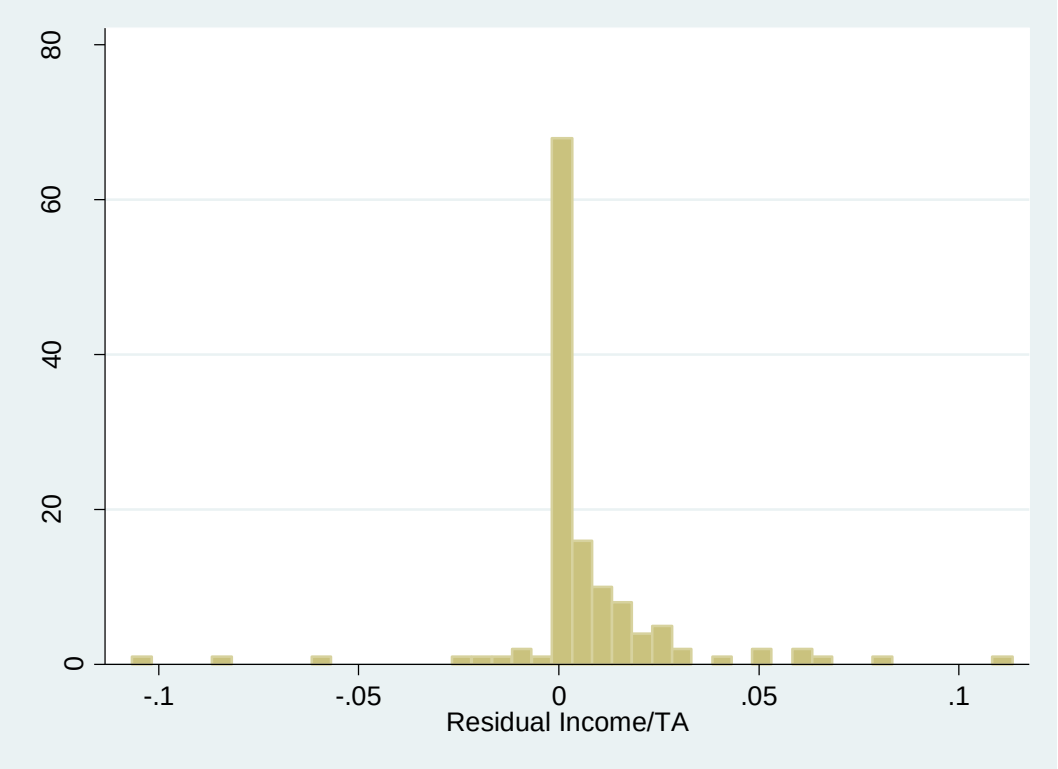
	Residual income (*RI*)			Operating Income (*OI*)		
	Coef.	*Z-stat*		*Coef.*	*Z-stat*	
c	14.5599	1.61		21.8680	2.10	**
DA	-15.9687	-1.96	**	-17.9043	-1.72	*
OI/TA_{t-1}	17.9989	2.47	**	-0.6305	-0.07	
LnTA	-0.3306	-0.69		-1.1787	-2.12	**
Δ*(Core income)*$/TA_{t-1}$	10.0847	2.01	**	14.3884	2.14	**
Δ*(Total expenditure)*$/TA_{t-1}$	-6.1756	-1.31		-12.7764	-2.09	**
Net assets/TA	-9.6858	-1.72	*	-5.8756	-0.84	
$\Delta WC/TA_{t-1}$	16.3550	2.13	**	13.3779	1.19	
Staff costs$/TA_{t-1}$	-1.4647	-1.24		-0.1649	-0.10	
Intangible assets$/TA_{t-1}$	26.4727	0.35		134.7281	1.26	
Wald statistic	16.17	*		12.74		
Pseudo R^2	0.1198			0.1129		
Pseudo likelihood	-66.8042			-41.6685		
N	134			134		
VIF DA	1.57			1.57		

Panel B: Dependent variable = the level of *RI* or *OI* (scaled by lagged TA) one year post-FT status

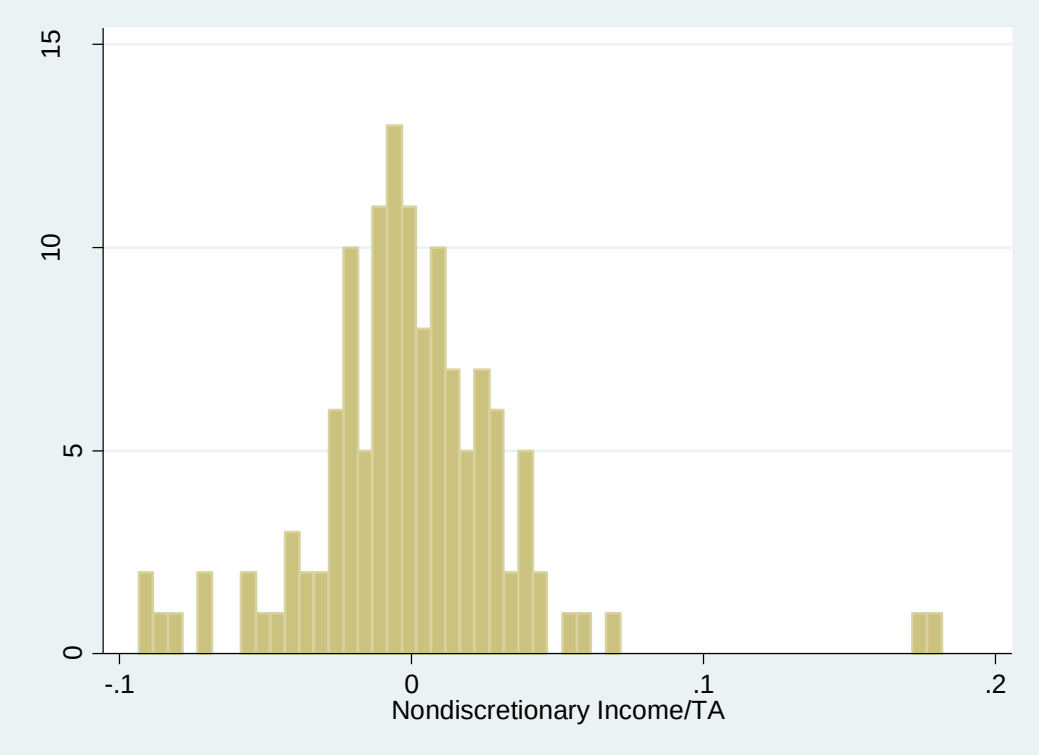
	Residual income (*RI*)			Operating Income (*OI*)		
	Coef.	*t--stat*		*Coef.*	*t--stat*	
c	0.3427	1.87	*	0.3643	2.04	**
DA	-0.1984	-1.94	*	-0.1441	-1.34	
OI/TA_{t-1}	0.2317	1.73	*	0.2102	1.43	
LnTA	-0.0224	-1.56		-0.0162	-1.17	
Δ*(Core income)*$/TA_{t-1}$	0.1795	1.93	*	0.0124	0.08	
Δ*(Total expenditure/)*TA_{t-1}	-0.1291	-1.70	*	0.0020	0.02	
Net assets/TA	-0.0707	-1.07		-0.1615	-1.57	
$\Delta WC/TA_{t-1}$	0.2243	1.51		0.3042	1.93	*
Staff costs$/TA_{t-1}$	-0.0177	-1.14		0.0030	0.15	

Intangible assets/TA$_{t-1}$	0.0900	0.10		-0.7085	-0.79
F-stat	2.40	**		1.81	*
R^2	0.1134			0.1217	
N	134			134	
VIF DA	1.64			1.64	

Note: Variable definitions are described in Sections 3.1 and 4.3. *, **, and *** indicates statistical significance at 10%, 5% and 1%, respectively.



Panel A



Panel B

Figure 1 Comparison of income distributions.